Iowa Peer Review for Travel Demand Model Calibration/Validation and Reasonableness Checking

Ames, Iowa
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Wilbur Smith Associates

My Background and Experience

- 25 years at the Michigan DOT, in a variety of travel demand modeling and project/corridor planning positions. Last position was as the Supervisor of the Urban Travel Analysis unit (12 years)
- Now with Wilbur Smith Associates. Manager of Traffic and Travel Demand Forecasting for the North Central U.S.
- Extensive experience in travel demand model calibration and applications.

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Overall Comments -1

- We develop travel models for a reason – to provide decision-makers with information with which to make decisions.
- Travel demand models should have value (especially to Tech & Policy Committee members!)
- I like travel models that are practical, useful, easy to learn & maintain. Most of the time you don't need a Cadillac – a Chevy will do. Need to support the LRTPs, corridor studies, subarea studies in an MPO area.

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Overall Comments – 2

- Model calibration/validation is the grinding – but need to do it to get to the fun stuff (model applications).
- Model applications. Sample traditional ones - LRTP's, new land uses, corridor studies. Sample non-traditional ones - Construction detour evaluations, fair-share financing. Think outside the box!!

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Overall Comments – 3

- Do top-down, systematic validation
- **When problems occur, be a detective!!**
- Good sources for guidance:
  - NCHRP 255
  - NCHRP 365
  - TMIP/FHWA Model Validation & Reasonableness Checking Manual
  - FHWA's Calibration & Adjustment of Systems Planning Models

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Overall Comments – 4

- It's OK to use Trip distribution K factors. But use them only if you have to.
- If you're going to do post-processing of model volumes, stay away from link factoring. It'll only get you in trouble down the line. Suggest you adjust areawide, or by corridor, FFC, etc.

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Overall Comments – 5

- Do top down validation.
- Validation targets:

  +/- 5% Areawide Assigned VMT vs. Count VMT

  +/- 5% Areawide Assigned Volumes vs. Count Volumes

Overall Comments – 6

- More validation targets:

  +/- 10% Screenlines Assigned Volumes vs. Count Volumes

  +/- 10% Cutlines Assigned Volumes vs. Count Volumes

  % RMSE < 30%

Overall Comments – 7

- Zone make-up: Try to keep L.U. homogenous.
- Trips/zone: Not more than 25,000 trips/zone, if possible.
- Centroid loadings: Don't load across physical barriers (one-way pairs are an exception).

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Common Calibration Problems You May Encounter

- **Bad Data** – O-D Survey, SE data, traffic counts, etc. (Solution: Start w/ good data (duh!!). But easier said than done).
- **Trip Lengths to long or short** (Solution: Change the Friction Factors)
- **Bridges over or under-assigning** (Solution: 1. Apply trip distribution K Factors; 2. Change travel time on the bridge)
- **No time for calibration** (Solution: Post-processing of the assignments)

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Tips

- #1 - Apply common sense. ***Never*** use raw model numbers without examining them. Do they make sense? Are they reasonable? Rationale? Logical?
- #2 - See #1.
- Trust your instincts. You're the modeling expert in your MPO. If something doesn't look right, it probably isn't.

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More Tips

- Make your model stream easy to replicate, so that you (and someone after you) can do it over and over, easily. Don't want to have to reinvent the wheel.
- On your network, if you're going to alter link speeds in a corridor (volumes too high or low), suggest you make small changes over many links, not a huge change on one link.

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Still More Tips

- Do the model documentation as you do the work. If you leave it to the end of the process, it's always tougher to do (less time, forget stuff, etc.).
- A FSUTMS-type structure would be a good idea for Iowa. Can be used as a guide at first, then later a standard.
- Number of zones rule of thumb – 1 zone /1,000 pop.

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